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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,666	10/17/2003	James Crawford	930021-2019.A	1211

20999 7590 01/29/2007
FROMMER LAWRENCE & HAUG
745 FIFTH AVENUE- 10TH FL.
NEW YORK, NY 10151

EXAMINER	
BUTLER, PATRICK	
ART UNIT	PAPER NUMBER
1732	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,666	CRAWFORD ET AL.	
	Examiner	Art Unit	
	Patrick Butler	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *35-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20040209*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 35 and 39-41 are rejected under 35 U.S.C. 102(b) as being anticipated by McCullough et al. (US Patent No. 4,868,038).

With respect to Claim 35, McCullough teaches making a carbonaceous fiber fabric (graphite fabric) comprising providing a pitch precursor fiber (see col. 3, lines 32-43), stretch breaking the precursor yarn (see col. 4, lines 8-19), which necessarily includes drawing and, at least temporarily, a lower filament count given that breaks not previously present lengthen the yarn and the breaks reduce the filament count at their locations, forming the yarn into a fabric (see Fig. 5), heat treating the formed fabric to 1500 °C, which would convert the fabric to carbonaceous (graphitic) fibers (see col. 4, line 59-col. 5, line 2).

With respect to Claim 39, McCullough teaches that the fabric may be woven (see col. 6, lines 21-26).

With respect to Claims 40 and 41, McCullough teaches impregnating the fabric by coating the fabric with a resin (see col. 6, lines 59-61), which is a carbon containing material (carbonaceous mixture) such as polyethylene and polycarbonate (thermoplastic resin) (see col. 2, lines 32-49).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US Patent No. 4,868,038) as applied to claim 35 above, and further in view of Lohrke Jr. (US Patent No. 2,941,259).

With respect to Claim 36, McCullough teaches utilizing stretch-breaking to make a fabric as previously described. However, McCullough does not expressly teach the individual steps of stretch-breaking, particularly twisting after stretch-breaking and spinning the yarn.

Lohrke teaches converting filament yarn to a staple yarn with stretch breaking involves converting to staple by stretch breaking (see Claim 5, col. 6, lines 13-21) and then twisting to form a yarn (see col. 4, lines 43-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lohrke's stretch-breaking techniques with McCullough's stretch breaking process in order to properly stretch break the yarn and maintain its integrity via the frictional forces imparted by twisting.

With respect to Claim 38, Lohrke's drawing ratio is 9, which reads on the claimed range of 5-20 (see col. 5, lines 10-17).

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US Patent No. 4,868,038) as applied to claim 35 above, and further in view of Davies et al. (US Patent No. 5,756,206).

With respect to Claim 37, McCullough teaches using a stretch-broken staple yarn in a composite as previously described. However, McCullough does not expressly teach utilizing a serving yarn with the spun yarn.

Davies teaches when making a spun yarn of high performance fibers, it is appropriate to wrap the spun yarn with serving yarn (see col. 5, lines 30-34 and col. 10, lines 66 through col. 11, line 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Davies's serving yarn with McCullough's staple yarn in order to hold the tow together (see col. 11, lines 17-21).

Claims 42 and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US Patent No. 4,868,038) as applied to claim 35 above, and further in view of Tortora (*Understanding Textiles*, pages 250 and 251).

With respect to Claim 42, McCullough et al. teaches making a graphite fabric as previously described. The precursors are pitch or polyacrylonitrile (PAN) (see col. 3, lines 32-43). However, McCullough does not expressly teach blending the two together.

Tortora teaches blending combining different fiber species (see *Understanding Textiles*, page 250, Blends section, first paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine fibers as taught by Tortora when using the pitch and

PAN fibers taught by McCullough in order to produce yarns with characteristics that cannot be obtained by using one type of fiber or another (see *Understanding Textiles*, page 250, Blends section, second paragraph) such as the cost savings of blending in the lesser-cost fiber. Alternatively, the motivation would be to blend as taught by McCullough (see col. 6, lines 9-12) except as a hybrid yarn as taught by Tortora (see *Understanding Textiles*, page 250, Blends section, first paragraph) in order to blend as early as possible (see *Understanding Textiles*, page 250, Blends section, third paragraph).

With respect to Claim 46, McCullough teaches that the fabric may be woven (see col. 6, lines 21-26).

With respect to Claims 47 and 48, McCullough teaches impregnating the fabric by coating the fabric with a resin (see col. 6, lines 59-61), which is a carbon containing material (carbonaceous mixture) such as polyethylene and polycarbonate (thermoplastic resin) (see col. 2, lines 32-49).

Claims 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US Patent No. 4,868,038) in view of Tortora (*Understanding Textiles*, pages 250 and 251) as applied to claim 42 above, and further in view of Lohrke Jr. (US Patent No. 2,941,259).

With respect to Claim 43, McCullough teaches utilizing stretch-breaking to make a fabric as previously described. However, McCullough does not expressly teach the individual steps of stretch-breaking, particularly twisting after stretch-breaking and spinning the yarn.

Lohrke teaches converting filament yarn to a staple yarn with stretch breaking involves converting to staple by stretch breaking (see Claim 5, col. 6, lines 13-21) and then twisting to form a yarn (see col. 4, lines 43-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lohrke's stretch-breaking techniques with McCullough's stretch breaking process in order to properly stretch break the yarn and maintain its integrity via the frictional forces imparted by twisting.

With respect to Claim 45, Lohrke's drawing ratio is 9, which reads on the claimed range of 5-20 (see col. 5, lines 10-17).

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US Patent No. 4,868,038) in view of Tortora (*Understanding Textiles*, pages 250 and 251) as applied to claim 42 above, and further in view of Davies et al. (US Patent No. 5,756,206).

With respect to Claim 44, McCullough teaches using a stretch-broken staple yarn in a composite as previously described. However, McCullough does not expressly teach utilizing a serving yarn with the spun yarn.

Davies teaches when making a spun yarn of high performance fibers, it is appropriate to wrap the spun yarn with serving yarn (see col. 5, lines 30-34 and col. 10, lines 66 through col. 11, line 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Davies's serving yarn with McCullough's staple yarn in order to hold the tow together (see col. 11, lines 17-21).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Butler whose telephone number is (571) 272-8517. The examiner can normally be reached on Mo.-Th. 7:30 a.m. - 5 p.m. and alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PB

Patrick Butler
Assistant Examiner
Art Unit 1732

CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER
1/22/07